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A letter of limited circulation was made on: The Radioactive Contamination of the River Resulting from the Discharge of Cooling Water Into It (MUC-HG - 53).

The tolerance concentration as far as external radiation effects on a body such as a fish immersed in water was found to be about 10^{-11} watts of radioactive energy emitted per cm^3 of the water. For 2 MeV gamma rays this corresponds to about 2×10^{-5} curies/cu ft. There is also the tolerance concentration for continued drinking of contaminated water. This was found to correspond to a somewhat higher concentration than that for immersion. In view of the uncertainties of such calculations 10^{-5} curies/cu ft of energetic gamma-rays and beta-rays has been taken as the tolerance figure. On the basis of this a calculation indicated that for a pile of 5×10^5 kw a fractional coating failure of 10^{-3} would have to result before the fission products which are ejected directly into the cooling water would bring the activity to the tolerance concentration in a river of 35,000 cu ft/sec. at a point 1 minute from the pile. At one hour from the pile it was estimated that 6% of the coating would have to fail before the tolerance concentration would be reached by the activity resulting from the recoil mechanism.

For the activity resulting from the dissolving of uncoated metal a calculation indicated that the total activity of the metal in a 5×10^5 kw pile one minute after shut down would correspond approximately to 4×10^8 curies of gamma-rays and beta-rays. This value to give a tolerance concentration in a river of 35,000 cu ft/sec. a fractional rate of loss of